(5) heterozygotes; in the numerous cases where heterozygotes differ from either parent, "the ability to transmit certain characters is correlated with other *apparent* characters." Under gametic correlations are placed the phenomena of partial and complete "coupling," so called, developed chiefly by BATESON.—R. R. GATES.

Tyloses in ferns.—It has been noted by various writers that in the stems and petioles of ferns the protoxylem groups suffer disintegration, and into the cavities so formed the wood-parenchyma grows, forming the "cavity-parenchyma" of Russow. Proliferations from these cells frequently fill the cavities, and present the appearance of tyloses. These growths have recently been studied in detail by two independent workers, KIRSCH[21] and Miss MCNICHOL.[22] Both writers show that the phenomenon is widespread, being found in nearly every family of the true ferns, as well as in Marsilia and the Ophioglossaceae. In both papers the cells in question are carefully described and their origin as stated above is proven. KIRSCH has studied *Pteris aquilina* in most detail, and finds cavity-parenchyma in the stipe and in all regions of the rhizome, where it occurs in the outer system of bundles which he erroneously regards as cortical (p. 388). He offers the following as a theory of the cause of these growths: the cavity formed by disintegration of the protoxylem at first functions as a water duct; later the metaxylem (secondary xylem according to KIRSCH) makes its appearance and performs the duty of water carrier. Hence the pressure in the cavity is reduced, and as a consequence tyloses grow into it.—M. A. CHRYSLER.

Composition of a field of maize.—A brief paper by SHULL[23] calls attention to the view, already expressed by DEVRIES and others, that a field of corn, like wheat and other grains, is made up of a number of elementary species or biotypes. He discusses the fact that inbreeding in corn results in deterioration, and points out that the old hypothesis that the deleterious effects of inbreeding result from the accumulation of disadvantageous individual variations to form an organism with an inharmonious or unbalanced constitution, is untenable, in view of the facts of cleistogamy, self-pollination, and parthenogenesis in plants which have evidently been successful in the struggle for existence. A cornfield is conceived to be a series of hybrids between elementary species, and on the basis of the common observation that hybrids between nearly related forms are more vigorous than either parent, he believes that over-selection, which eliminates down to a single biotype, results in deterioration, not intrinsically from inbreeding, but because the greater vigor which comes from the crossing of biotypes has been eliminated. The

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[21] KIRSCH, SIMON, On the development and function of certain structures in the stipe and rhizome of *Pteris aquilina* and other Pteridophytes. Trans. Royal Soc. Canada III. 14:353–412. *figs. 27+21*. 1907.

[22] MCNICHOL, M., On cavity parenchyma and tyloses in ferns. Annals of Botany 22:401–413. *pl. 25*. 1908.

[23] SHULL, GEO. H., The composition of a field of maize. Amer. Breeders' Assoc. 4:pp. 6. 1908.